

## Sensitivity Analysis and Optimization of a Carbon Capture System for IGCC Power Plant

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A CO<sub>2</sub> emission regulation on every power industry will take effect soon because of the global warming. Therefore, Integrated Gasification Combined Cycle(IGCC) power plant also should apply CO<sub>2</sub> capturing system in the future. Pre-combustion carbon capture based on physical absorption is appropriate for IGCC while considering high temperature and CO<sub>2</sub> partial pressure of the syngas. Selexol process which uses Dimethyl Ether of Polyethylene Glycol(DEPG) among physical absorbents is developed as one of the popular and effective pre-combustion technology. However, the thermal efficiency of IGCC with CO<sub>2</sub> capture is decreased. Therefore, finding the optimal operation between maximized profit and restriction is important issue.

In this study, we propose the optimized pre-combustion process viewed from the profit maximization under various scenarios of the emission credit price and the emission restriction level using ASPEN PLUS. Variables that mainly affect the profit of the process are found by sensitivity analysis. Then, Selexol process is optimized by altering key variables to obtain the maximized profit under several scenarios.